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## Antiplasmodial isoprenylated flavonoids from the stem bark of *Erythrina ovalifolia* Roxb

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### ABSTRACT

Four isoprenylated flavonoid derivatives, erythrisenegalone (1), alpinumisoflavone (2), phaseollidin (3), and sandwicensin (4) were isolated from the stem bark of *Erythrina ovalifolia* Roxb. Their structures were elucidated on the basis of spectroscopic analyses. Compounds 1–4 were evaluated for their antiplasmodial properties against *Plasmodium falciparum*, showing their  $IC_{50}$  were 1.69, 1.98, 1.66, and 1.83  $\mu$ g/mL, respectively.

**Keywords:** *Erythrina ovalifolia*, Phenolic compound, Antiplasmodial

### INTRODUCTION

Malaria is a major cause of death in the world than any parasitic infection, especially in tropical developing countries. This disease has been found endemic at all region in Indonesia. Recently, chloroquine and artemisinin have used as antimalarial drugs and showed resistance against *Plasmodium* parasites in Indonesia. *Erythrina* belongs to the family Leguminosae, this plant has been shown to produce a number of pterocarpans, flavonoids, and alkaloid compounds which showed activity as anticancer, antioxidant, antiviral and antimalaria [1,2,3,4]. Decoction of the stem bark or leaves of *Erythrina ovalifolia* Roxb has been used in the Indonesian people as a traditional medicine for malaria. In continuation of these chemical investigations, we have examined *Erythrina ovalifolia* Roxb and succeeded in isolating four flavonoid compounds, with namely erythrisenegalone (1), alpinumisoflavone (2), phaseollidin (3), and sandwicensin (4). This paper discusses the structure elucidation of the four isoprenylated flavonoids and antiplasmodial properties of compounds 1–4 against *Plasmodium falciparum*.

### MATERIALS AND METHODS

#### General

UV and IR spectra were measured with a Shimadzu 1800 and Perkin Elmer Spectrum One FTIR spectrometer, respectively.  $^1\text{H}$  and  $^{13}\text{C}$  NMR spectra were recorded with a JEOL ECA400 spectrometer operating at 400 ( $^1\text{H}$ ) and 100 ( $^{13}\text{C}$ ) MHz in  $\text{CDCl}_3$  using TMS as the internal standard. Mass spectra were obtained with a Waters LCT Premier XE. Vacuum liquid chromatography (VLC) and radial chromatography were carried out using Si gel 60 GF<sub>254</sub> and Si gel 60 PF<sub>254</sub>, for TLC analysis, pre-coated silica gel plates (Merck Kieselgel 60 GF<sub>254</sub>, 0.25 mm thickness) were used. Solvents used for extraction and preparative chromatography were of technical grade and distilled before use.

#### Plant material

The stem bark of *E. ovalifolia* Roxb was collected from Kunir Kidul Village, District Lumajang, East Java, Indonesia. The plant was identified at the Herbarium Bogoriense, Bogor Botanical Garden, Bogor, Indonesia.